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Final Technical Report

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**"Wide Field Imaging of Solar System Objects
with an 8192 x 8192 CCD Mosaic"**

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Submitted by

**Donald N.B. Hall
Principal Investigator and Director
Institute for Astronomy**

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WITH AN 8192 X 8192 CCD MOSAIC
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FINAL TECHNICAL REPORT

"Wide Field Imaging of Solar System Objects with an 8192 x 8192 CCD Mosaic"

As part of this program, we successfully completed the construction of the world's largest CCD camera -- an 8192 x 8192 CCD mosaic. The system employs 8 2K x 4K 3-edge buttable CCDs arranged in a 2 x 4 chip mosaic. The focal plane has small gaps (<1 mm) between mosaic elements and measures over 120 mm x 120 mm.

The initial set of frontside illuminated CCDs were developed with Loral-Fairchild in a custom foundry run. The initial lots yielded of order 20 to 25 functional devices, of which we selected the best eight for inclusion for the camera. We have designed a custom 3-edge-butable package that ensures the CCD dies are mounted flat to +/- 10 microns over the entire area of the mosaic.

The mosaic camera system consists of eight separate readout signal chains controlled by two independent DSP microcontrollers. These are in turn interfaced to a Sun Sparc-10 workstation through two high speed fiber optic interfaces.

The system saw first-light on the Canada-France-Hawaii Telescope on Mauna Kea in March 1995. First-light on the University of Hawaii 2.2-M Telescope on Mauna Kea was in July 1995. Both runs were quite successful. A sample of some of the early science from the first light run is reported in the publication, "Observations of Weak Lensing in Clusters with an 8192 x 8192 CCD Mosaic Camera."